

PATENT SPECIFICATION

DRAWINGS ATTACHED

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Flavoured drinking straws and method and apparatus for making the same.

COMPLETE SPECIFICATION

I, BURDETTE RICHMOND FARRAND, of 171 Douglas Drive, in the City of Toronto, in the Province of Ontario, Canada, a citizen of Canada do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:

This invention relates to a method of and an apparatus for producing flavoured drinking straws.

The flavoured drinking straws of the prior art usually have been formed by taking previously prepared straws and dipping them in flavouring material; or inserting within each formed straw a thin rectangular strip element coated with flavour buds. This flavour carrying element is usually frictionally engaged within the tubular body of the straw by distortion of said body with said strip.

As is well known in the art, flavoured drinking straws have to date been considerably more expensive to manufacture than ordinary drinking straws, since the art has not hitherto included a method and apparatus whereby the straws could be coated with flavouring material during the actual manufacture of the straws themselves, and it has therefore been necessary to subsequently treat the individual straws in a separate process in order to insert or apply therewith the flavouring medium.

The present invention discloses an entirely novel method and apparatus whereby, for the first time, straws may be internally coated with flavouring material during the actual production of the straws themselves. Using my novel method and apparatus, I am able to produce flavoured straws at a small fraction of the cost of the flavoured straws hitherto produced. The present invention is a method of forming flavoured, tubular drinking straws which comprises producing a continuous tube by spirally

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winding strip material upon the exterior surface of a mandrel having an axial bore, bonding the strip material together, and axially drawing the spirally wound strip material along the mandrel; coating the interior of the thus-formed tube with a spiral deposit of soluble flavouring material by feeding flavouring material through said mandrel at a controlled rate so as to form a thin deposit on the inner wall of the tube as the latter is axially and spirally drawn off the mandrel; and cutting the tube into suitable lengths.

The present invention is further an apparatus for forming a continuous tube by spirally winding upon a mandrel and bonding together strip material which is then axially cast off the end of the mandrel in the form of a continuous rotating tube, the apparatus comprising means for applying a spiral deposit of soluble flavouring material to the interior surface of said tube, said means comprising a vessel adapted to store a flavouring material in flowable form, a bore extending longitudinally through the tube-forming region of the mandrel, a conduit leading from said vessel into said bore, at a point behind said tube-forming region and valve means for controlling the rate of flow of flavouring material from said vessel through said conduit and bore to the interior of a tube being formed upon said mandrel.

One of the attractive features of the present invention is the fact that the method of the invention can be introduced with facility and very little expense into an otherwise conventional process for producing straws by spirally winding strips of paper or like material about a mandrel. Furthermore, the apparatus required for practising the present invention merely entails the addition of a few extra parts to and the modification of one part in a conventional apparatus for producing spirally

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wound straws.

In the accompanying drawing which illustrates, by way of example, the method, apparatus and product of the invention:

5 Fig. 1 is a perspective view of one embodiment of apparatus according to the invention;

10 Fig. 2 is a considerably enlarged, partial-sectional view of the means for applying the spirally arranged flavouring deposit taken along the line 2—2 of Fig. 1;

15 Figs. 3 to 6, inclusive, are side elevations of different products of the invention, these figures showing various ornamental effects which can be produced with the process according to the invention.

The process and apparatus for producing spirally wound straws will now be described.

20 In the method and apparatus as illustrated in Fig. 1, an inner strip 10 and an outer strip 11, both strips being formed of paraffined paper, are spirally wound upon a fixed mandrel 12, which will be described in detail later the outer strip 11 being coated
25 on one side thereof with bonding composition before it reaches the mandrel. Strips 10 and 11 are drawn off freely mounted supply reels (not shown). The inner and
30 outer strips 10 and 11 are drawn axially along the mandrel by means of a continuous tape belt 13 which is thrice wound around the mandrel as indicated at 14, the tape
35 being carried by a pair of horizontally disposed pulleys 15 and 16, pulley 15 being driven and pulley 16 being an idler. The tape 13 is spirally wound about the mandrel 12, the pulleys 15 and 16 are so located
40 relative to the centre line of the mandrel, and the belt is so tensioned, that the belt 13 provides a motive force which serves to (1) draw the strips 10 and 11 from their supply
45 reels, (2) continuously spirally wind the two strips upon the mandrel 12, (3) axially draw the spirally wound strips along the mandrel and (4) cast the thus wound strips off the
50 mandrel in the form of a continuous paper tube.

This continuous paper tube, labelled A in the drawings, is fed into a cutting means 17 which serves to slice the tube into a plurality of straws of equal length. A group of rollers 18 is provided for tensioning the tape belt 1 and the apparatus includes a sliding collar arrangement 19 which is only utilized
55 when adjusting or replacing the belt 13. The same source of power (not shown) which drives pulley 15 also serves, through gearing contained in a gear box 20 and through a
60 shaft 21, a shaft 22 and a universal joint 23 connecting shafts 21 and 22, to drive a roller 24 which is fixed on shaft 22 and is arranged to dip into a pool of bonding composition held in a box 25. Outer strip 11 is brought
65 into contact with the roller 24 when en

route to the mandrel, whereby to apply a coating of bonding composition to the underside of the outer strip. Secured to the top of box 25 is a feed guide 26 for the strips 10 and 11. Feed guide 26 not only serves
70 to insure that the strips are presented to the mandrel at the desired angle but also cleans off any imperfectly cut off excess material clinging to the edges of the strips or any tramp material which may be carried
75 by the strips.

In accordance with the present invention, the mandrel which, as best seen in Fig. 2, has a bore 27 which extends from the tip of the mandrel to a point well behind the tube-forming region of the mandrel. The inner end of the bore 27 communicates with a lateral bore 28 and a conduit 29 leading from a fixed pressure vessel 30 communicates with bore 28, suitable connecting
80 means 31 being used to join the conduit to said bore. A valve or metering means 32 is inserted in the conduit 29 to control the rate of flow of material from the vessel 30 through the conduit 29 and bores 28 and 27 into the continuous tube A being cast off the end of the mandrel.

It will be appreciated by those familiar with the art of fabricating spirally wound straws, that the tube A will have a rotary
95 motion as well as a motion axially away from the mandrel 12 toward the cutting means 17. It will also be appreciated that the tube A will, during any given production period, have a substantially constant axial
100 speed and a substantially constant rotary speed. Bearing this in mind it will be appreciated that when flavouring material is caused to flow the bore 27 at a constant
105 rate, this flavouring material will be spirally deposited upon the interior of the rotating and axially-moving continuous paper tube A.

It should be noted that the rate of flow of the flavouring material may be adjusted
110 in relation to the motions of the tube A to provide flavouring deposits of varying widths. The results achievable with such adjustments have been illustrated in Figs. 3 to 6 inclusive, which show straws according to the invention, which have been produced by progressively increasing the rate of flow of the flavouring material through the bore 27 into the interior of the continuous tube being cast off the end of the
120 mandrel. These different effects are only observable when the strips 10 and 11 which form the tube are transparent or translucent. This, however, is no drawback since the material usually employed in the making of
125 spirally wound straws is paraffined paper, a translucent material. In any case where the straw is transparent or translucent, the spiral coating of flavouring material serves not only to impart flavour to liquids drawn
130

through the straw, but it also serves to ornament the straws with a spiral band, the width of which may be varied to produce a series of different ornamental designs, as shown in Figures 3 to 6.

Certain flavouring materials can be provided in a form in which, while they can be made to flow to the tube A, they will nevertheless dry reasonably quickly on the interior of the tube without heating and without flowing away to any appreciable extent from the areas of the tube upon which they were first deposited. However, with a number of flavouring materials, it is desirable to apply heat to the tube A in order to dry the deposited strip of flavouring material. For this purpose, I presently prefer to position hot air blast heaters, as indicated at 33 and 34 in Figure 1, between the mandrel and the cutting means 17. With certain flavouring materials, it may be found desirable to also heat the fixed pressure vessel 30 so as to keep the flavouring material in flowable form.

A gravity feed could be employed instead of holding the flowable flavouring material under fixed pressure in the vessel 30. If a gravity feed is employed, some arrangement would preferably be included for providing a constant head of material leading in the conduit 29.

The strips 10 and 11 need not be formed of paraffined paper, since various substitutes are available such as cellophane ("cellophane" being a Registered Trade Mark) and clear or transparent thermoplastic material. Depending upon the nature of the material selected, a solvent may be substituted for the bonding composition or heat-sealing of the two strips might be carried out after they have been wound upon the mandrel. While I prefer forming the tubes by winding two strips of material as described, the straws can be formed by the winding of one strip and by the winding of more than two strips. It should be understood, therefore, that while the foregoing specification sets forth the preferred construction, it is not limited thereto.

WHAT I CLAIM IS:

1. A method of forming flavoured, tubular drinking straws which comprises producing a continuous tube by spirally winding strip material upon the exterior surface of a mandrel having an axial bore, bonding the strip material together, and axially drawing the spirally wound strip material along the mandrel; coating the interior of the thus formed tube with a spiral deposit of soluble flavouring material

by feeding flavouring material through said mandrel at a controlled rate so as to form a thin deposit on the inner wall of the tube as the latter is axially and spirally drawn off the mandrel and cutting the tube into suitable lengths.

2. A method as claimed in claim 1 including the step of heat-drying the continuous tube after it leaves said mandrel so as to dry said spiral deposit.

3. A method as claimed in claim 1 or 2, in which the strip material is transparent or translucent to make the spiral deposit visible therethrough so that it functions additionally as an ornamentation.

4. An apparatus for forming a continuous tube by spirally winding upon a mandrel and bonding together strip material which is then axially cast off the end of the mandrel in the form of a continuous rotating tube, the apparatus comprising means for applying a spiral deposit of soluble flavouring material to the interior surface of said tube, said means comprising a vessel adapted to store a flavouring material in flowable form, a bore extending longitudinally through the tube-forming region of the mandrel, a conduit leading from said vessel into said bore, at a point behind said tube-forming region, and valve means for controlling the rate of flow of flavouring material from said vessel through said conduit and bore to the interior of a tube being formed upon said mandrel.

5. An apparatus as claimed in claim 4, comprising means for heating the formed tube after it is cast off the mandrel.

6. The method of forming flavoured tubular drinking straws substantially as hereinbefore described with reference to the accompanying drawing.

7. Apparatus for forming a continuous tube substantially as hereinbefore described with reference to the accompanying drawing.

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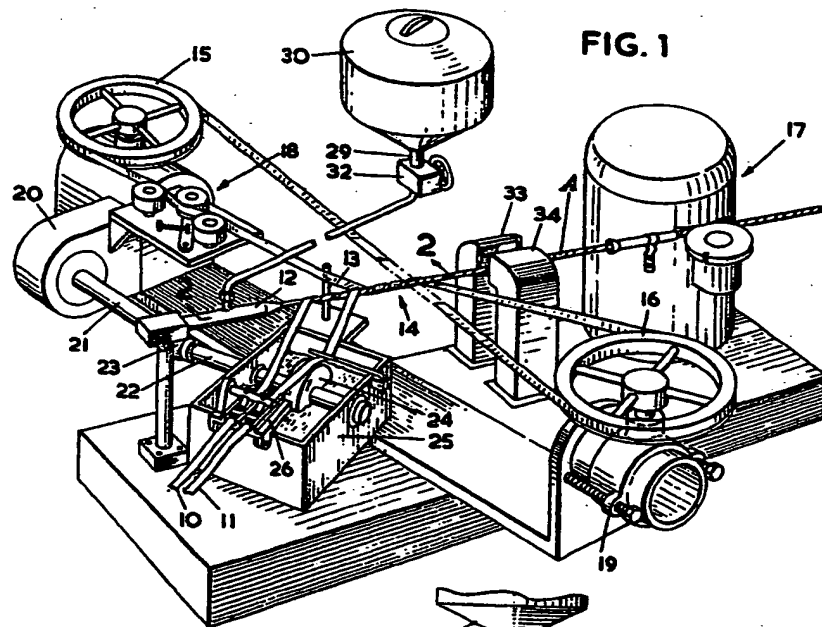


FIG. 1

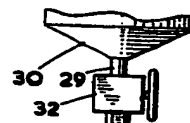


FIG. 2

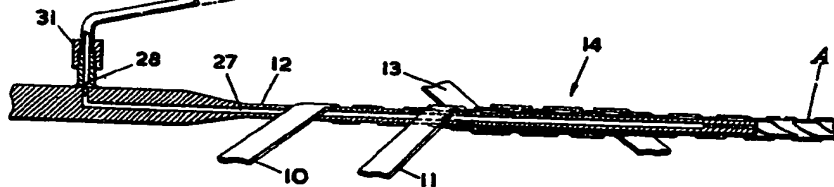


FIG. 3

FIG. 4

FIG. 5

FIG. 6

